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Published in:

Scandinavian journal of child and adolescent psychiatry and psychology

DOI:

[10.21307/sjcapp-2020-001](https://doi.org/10.21307/sjcapp-2020-001)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2020

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Batstra, L., Foget, L., van Haeringen, C., Meerman, S. T., & Thoutenhoofd, E. D. (2020). What children and young people learn about ADHD from youth information books: A text analysis of nine books on ADHD available in Dutch. *Scandinavian journal of child and adolescent psychiatry and psychology*, 8, 1-9. <https://doi.org/10.21307/sjcapp-2020-001>

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What children and young people learn about ADHD from youth information books: A text analysis of nine books on ADHD available in Dutch

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is not a singular concept. For the purposes of this study, understandings of ADHD are assumed also to spread along a conceptual dimension that includes some combination of biomedical and psychosocial knowledge. Biomedically, ADHD may be considered a somatic affliction causing inattention and hyperactivity, amenable to pharmaceutical treatment. Psychosocially, ADHD ranks among adverse behaviour patterns that are amenable to psychosocial and pedagogical intervention. Considering both biomedical and psychosocial factors are associated with the ADHD construct, it seems self-evident that young people should be offered information that gives equal consideration to both ways of addressing ADHD, but the question is just how balanced the information available to young people is. This study investigated nine information books on ADHD available in the Netherlands in Dutch, aimed at children and young people up to age 17. Thirteen perspective-dependent text elements were identified in qualitative content analysis. Eight attributes associate with a biomedical view: ADHD as cause, biological factors, clinical diagnosis, brain abnormality, medication, neurofeedback, heritability and persistence. Five text elements associate with a psychosocial view: ADHD as perceived behaviour, environmental factors, descriptive diagnosis, behavioural intervention and normalisation. The most frequent text passages encountered describe ADHD as a brain abnormality, along with medical and behavioural treatment. Providing the main focus for information in eight out of nine books, biomedical information about ADHD predominates in the available youth information books, while psychosocial information about ADHD is far less well covered.

Key words: ADHD; psychoeducation; youth information books; biomedical perspective; psychosocial perspective

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is defined by the 5th edition of the Diagnostic and Statistical Manual as developmentally inappropriate inattention and impulsivity with or without hyperactivity (1). In the US 2.2 million school-age children, aged 6-11 (amounting to 8.9 percent of this age group) have a current diagnosis of ADHD. Two-thirds of these children are prescribed medication (2). In the Netherlands, it is unknown how many children are diagnosed with ADHD, but 97,000 children — 4.3% of the total population of school-aged children

— are on methylphenidate, the most common drug prescribed after ADHD diagnosis (3).

For this study, we divide conceptions of ADHD roughly into more biomedical (4) and more psychosocial views (5). While we realise other positions are common and wholly divergent views have also been put forward in the scholarly literature (e.g., 6), biomedical and psychosocial views are typically present in some combination in scholarship, and are probably co-present in popular perception. The two main conceptions of ADHD are of course not mutually exclusive and can logically co-exist, for example in the widespread view that ADHD involves

a combination of somatic and environmental risk factors. At their extremes though, both perspectives may be considered exclusive. At the biomedical extreme, ADHD has a somatic cause and is therefore given by nature: it is a natural kind. While at the psychosocial extreme, behaviour (and how or whether we name, order and attend to it) is seen as consequent upon 'nurture': it is a social kind. Research into ADHD however spreads across disciplines, and so in principle foretells some sort of scientific integration of the nature and nurture attributes of ADHD.

Although the authors of youth information books on ADHD might project an integrated nature/nurture picture of ADHD for example by covering both biomedical and psychosocial risk factors, such books are perhaps as likely to reflect the kind of biogenetic bias that has been reported for other public sources (7–9). Before investigating the presence and relative co-occurrence of biomedical and psychosocial views in youth information books, we will first describe these two perspectives in their most expressly stated form, including reasonable disagreements that apply between them.

Within a biomedical view, ADHD is considered a highly inheritable and persistent neurodevelopmental disorder (4) causing inattention, hyperactivity and impulsivity (10, 11). Biederman and Faraone (11) attribute 76% of ADHD to genes. The disorder is thought to be present as a physical kind, in the form of a demonstrable brain defect with different size distributions across certain parts of the brain (12).

In contrast, those subscribing to a psychosocial view of ADHD point to the absence of biological tests for ADHD (5) and to the lack of evidence concerning long term benefits of taking medication for ADHD (13, 14). Biological differences like smaller brain parts or specific genes have only been demonstrated at group level, and do not apply to many of those classified as ADHD, while they are present in many individuals without an ADHD classification (15). Moreover, even if a biological basis for certain behaviours were found, this would not justify speaking of disorders rather than differences. Ultimately — and particularly in light of the subjective and context-dependant criteria for ADHD — human beings decide what behaviours are considered as (ab)normal (16). Various scholars have noted (5, 17, 18) — along with philosophers taking issue with conceiving of mental disorders as natural kinds (19, 20) — that ADHD behaviour strongly interacts with contemporary cultural phenomena, also along Bronfenbrenner's model of micro, meso and macro influences on behaviour and well-being (21). For convenience, we name all such psychosocial and cultural influences 'psychosocial'.

Apart from disagreeing on what the scholarly evidence amounts to, another key difference between the two perspectives is that biomedical views focus on individual physical and mental attributes, while psychosocial perspectives focus on persons as social beings in social situations. Individual behaviour, while indicated genetically, is produced in context as a mostly sensible pattern of responses to the continuous stream of stimuli that are attributes of our (social) environment (22, 23). Johnston and Mash (24) note that the way in which parents raise their children influences whether, and to what extent, behavioural patterns that some describe as ADHD are likely to occur. A range of demographic factors, including the parental level of education, the family composition, the family and family members' social well-being (25) and adverse social conditions such as poverty (26), are all considered to connect with child behaviours soon filed under the ADHD construct. Social factors such as rising performance pressure on educational achievement and reduced tolerance for different behaviour have also been noted (27).

Another key difference between biomedical views and psychosocial views concerns the nature of causality, and hence the type of diagnosis. Biomedical views materially locate the cause of ADHD within the body — in particular, in brain tissue and/or in genetic material — and so diagnosis is *medical*, with ADHD-behaviour providing more or less clear indication of something physically out of order inside the body. In light of its focus on a psychosocial ecology, however, psychosocial views consider ADHD behaviour the dynamic outcome of — or a most typically understandable response to — a complex of social welfare, behaviour and child-rearing issues. These latter views highlight ADHD as a cultural construct, and so entails ADHD being a *descriptive* diagnosis: a name given to a cluster of behavioural characteristics that are out of sync with, for example, the orderly performance expectations that characterise our time (5).

A third and final difference worth highlighting is of course different treatment preference. Biomedical views focus on medication as primary treatment of ADHD, because — as with medical illness — medication is thought to work, also evidentially so (28). In relation to psychosocial views, however, Fabiano et al. (28) point to evidence for the effectiveness of behaviour therapy. Likewise, Timimi (5) pleads for clinical approaches that move beyond a focus on the controlling and standardised kinds of behaviour management that clinical diagnostic paradigms encourage, and that instead take account of the highly diverse contextual and relational issues that children and families present.

According to Taylor and colleagues (29), well-balanced education and advice should provide the

foundation for all treatment proposed for hyperkinetic disorders. To date, no analysis seems to have been conducted on the information that is provided more directly to children and youth in the form of youth information books: books that are explicitly aimed at educating and advising children and youth about ADHD. The goal of this study was to determine the balance of biomedical and psychosocial descriptions of ADHD in youth information books available in the Netherlands (so, written in Dutch). Our study design was straightforward. It focussed on identifying and counting the thematic elements of biomedical and psychosocial discourse varieties to be found in such books, and on balance of numerical evidence (a count of text passages coded alternatively as part of a biomedical or a psychosocial view) judging the information contained in each individual book.

Data selection

Included in our selection were books aimed at children and youth (up to and including age 17), that

had ADHD as their main topic, were in the genre educational/informative, and were either written in Dutch or translated into Dutch. Books were included if they were available for purchase, and/or available through the public library. Two exclusion criteria were established: novels were excluded because fact and fiction are likely to be interwoven in that narrative form, and books by the 'same author' were excluded. In such cases, the first found book was included, under the dual assumption that other books by the same author were likely to substantially reduplicate that author's views in the first book found, and that a particularly productive author might otherwise unjustifiably skew the distribution of views. All nine books matching the criteria were included in the analysis (see Table 1). Six of them had children with ADHD themselves as main audience, and three [5, 6, 7] were aimed at other children, such as classmates or siblings. All books discussed knowledge and understanding of ADHD as well as information on how to cope with it.

TABLE 1. Youth information books on ADHD written in Dutch and included in the present study

Title and subtitle	Author	Published	Age range (ca.)	Language source	Number of pages
1. ADHD? Laat je niets wijsmaken! (ADHD? Don't be fooled!)	Backer	2005	≥13	Dutch	119
2. Ben jij anders? Voorlichtingsboek voor kinderen met ADHD of een contactstoornis (Are you different? Information book for children with ADHD or a contact disorder)	Gerrits-Douma	2008	8–12	Dutch	92
3. Bijzonder druk: Mijn boek over ADHD (Especially rowdy: My book about ADHD)	Tulleners	2013	≤12	Dutch	90
4. Weet jij wat ADHD is? Ervaar en leer alles over kinderen met ADHD (Do you know what ADHD is? Experience and learn all about children with ADHD)	Baard	2013	≥8	Dutch	50
5. Ik en ADHD (Me and ADHD)	Kordelaar & Zwaan	2013	8–12	Dutch	88
6. Ik ken iemand met ADHD (I know someone with ADHD)	Raum	2014 (2011 in English)	8–11	Transl.	32
7. De wereld van Tom: Meer weten over ADHD (Tom's world: Knowing more about ADHD)	Wuts-van Haagen	2015	Not known	Dutch	38
8. Chaos in je hoofd: Als je ADHD of ADD hebt (Chaos in your head: When you have ADHD or ADD)	Eenhoorn	2015	12–18	Dutch	122
9. De AD(H)D survivalgids (The AD(H)D survival guide)	Taylor	2016 (2016 in English)	10–14	Transl.	117

Data analysis

View-dependent elements relating to either a biomedical or a psychosocial view were identified and listed following the literature on ADHD. These served as theory-driven, sensitizing concepts and guided a first reading of the texts. This has led to the identification of additional data-driven elements. A

single, clear coding frame was then constructed on the basis of this first reading. Two of the authors then separately coded the data using the coding frame and reached an inter-coder agreement of 87%. Then the nine books were each read repeatedly by the coders, in an effort to code all text passages that could be counted under the coding frame. Thereafter the

number of tokens occurring per element were counted and listed for each book separately, so that the frequency of elements ascribed to a biomedical view featuring in each of the books could be compared with the frequency of elements ascribed to a psychosocial view. Due to its integrated use of data-driven and theory driven attributes, as well as the additional quantification of the elements, this type of analysis can best be filed under Critical Discourse analysis (30).

With the followed procedure, thirteen view-dependent elements were identified in the nine books; 35 different codes (meaning attributes)

contributed to them. Nine of the thirteen elements were theory-driven: they had been determined by reviewing scholarly literature on ADHD and were subsequently also found in the books. The remaining four elements were data-driven: they were identified in the books themselves. Table 2 lists all thirteen elements that were found across the nine books. The data-driven elements (those view-dependent elements discovered in the books themselves) are given in italics.

TABLE 2. Biomedical and psychosocial view-dependent elements found in nine youth information books on ADHD

Biomedical view		Psychosocial view	
ADHD as cause	ADHD is caused by rowdy, obstreperous and inattentive behaviour	ADHD as perceived behaviour	ADHD indicates rowdy, obstreperous and inattentive behaviours that are changeable and may abate or disappear
<i>Biological factors</i>	ADHD is caused by biological factors	Environmental factors	External factors are (causally) associated with rowdy, obstreperous and inattentive behaviour
<i>Clinical diagnosis</i>	The diagnosis of ADHD is made by a medical specialist	Descriptive diagnosis	ADHD diagnoses are of a descriptive kind
Brain abnormality	ADHD is visible in deviations in brain size and/or differences in body chemistry	Behavioural intervention	Behavioural intervention is a (most) suitable response to rowdy, obstreperous and inattentive behaviour
Medication	Medication is the main or most obvious treatment of ADHD	<i>Normalisation</i>	Rowdy, obstreperous and inattentive behaviour is linked to normal child behaviour
<i>Neurofeedback</i>	Neurofeedback is a (most) suitable treatment of ADHD		
Heritability	ADHD is inheritable		
Persistent (chronic)	ADHD behaviours are chronic and/or unlikely to disappear		

Note. Italics indicate view-dependent elements

TABLE 3. The distribution of view-dependent elements per book

Book number	1	2	3	4	5	6	7	8	9	Total
<i>Biomedical view</i>	52	6	15	15	5	10	24	49	31	207
ADHD as cause	2			3		1			5	11
Biological factors	12			1	1		1	5		20
Clinical diagnosis	4		7			1		4	5	21
Brain abnormality	7	4	1	7	2		16	20	6	63
Medication	18	2	6	3	1	5	7	9	14	65
Neurofeedback								4		4
Heritability	6				1	2		7	1	17
Persistent (chronic)	3		1	1		1				6
<i>Psychosocial view</i>	6	1	9	6	7	4	3	30	25	91
ADHD as perceived behaviour				2	1		1	2		6
Environmental factors			1					1		2
Descriptive diagnosis	3		1			2		5		11
Behavioural intervention	3	1	5	4	6	2	2	22	21	66
Normalisation			2						4	6
% of biomedical elements relative to psychosocial elements per book	90	86	63	71	42	71	89	62	55	69

Results

More biomedical than psychosocial elements occur across the nine books collectively. Two hundred and seven text passages were coded with a biomedical element and 91 text passages were coded with a psychosocial element. The most common biomedical elements found in the nine books are 'brain abnormality' (63 passages) and 'medication' (65 passages). The most common psychosocial element found in the nine books is 'behavioural intervention' (66 passages).

The number of view-dependent elements occurring in the books were also computed per book. Table 3 lists how many of the elements were found per book.

Additional observations

A number of text passages from the books may be worth highlighting. Firstly, in the books we studied, the cause of ADHD tends often to be attributed to a brain abnormality. Eight of the nine books write about causation in this somatic form. For example:

It means that there is a clear connection between biological factors (the brain) and ADHD. Both the form and the functioning of certain brain areas are different when you have ADHD. (*ADHD? Laat je niets wijsmaken!*, p.57)

If you are a child or young person with ADHD, the development of your brain will be delayed by two to three years, relative to a child or young person without ADHD. (*Chaos in je hoofd*, p.38)

And indeed ... scientists have discovered that the brain of children with ADHD does function just a little different from the brain of children without ADHD! (*ADHD? Laat je niets wijsmaken!*, p.32)

In relation to the treatment of ADHD, it is noteworthy that all books studied discuss both medication and behavioural intervention. Here are some examples of text passages in the books that discuss medication:

Research has shown that medication, better than anything else, helps to suppress ADHD (and ADD) symptoms. (*ADHD? Laat je niets wijsmaken!*, p.83)

If your medication works, you will be able to think and remember things more clearly. You will also feel less hyper and have more control over what you say and do. (*De AD(H)D survivalgids*, p.35)

Scientists figured out that medication can often help to reduce certain ADHD characteristics. (*Chaos in je hoofd*, p.103)

On the other hand, a variety of behavioural interventions are also discussed in the books. Most of the treatments mentioned are however, of a far less formalized kind than might be expected, given the treatment options now available in psychology and education. Again, we highlight a few:

Try to tense your muscles and then relax them again — do this repeatedly, while listening to a relaxing tape or CD. (*De ADHD survivalgids*, p.67)

This is why parental training courses are frequently offered, where parents and carers can learn things that are useful in raising children. (*Chaos in je hoofd*, p.70)

Together with your teacher and your parents, you can keep a point-scoring system. You can earn points every day, at home and in school. (*Bijzonder druk*, p.75)

Limitations

Only books in Dutch were analysed in this study. Hence, our conclusions cannot be indiscriminately generalised to other countries. The two books that were translated from English contained more biomedical elements than the books that were originally written in Dutch, for example.

Another limitation concerns the difficulties we encountered while coding for behavioural interventions. We initially intended to code a passage as behavioural intervention far more strictly, namely only when it concerned a recognised psychological or psychosocial method conducted under strict professional supervision by a trained and qualified psychologist, therapist or pedagogue. However, the books we studied offered fairly cursory behavioural advice for young people and parents in relation to dealing with ADHD behaviour, such as the examples cited above. Since the books did not explicitly link restless behaviour to (lack of) parental skills, wherever it was suggested in the books that parental training could help parents manage their child, the suggestion could therefore be considered an extension to the biomedical view rather than being in opposition to it under our coding frame. Still, had we more strictly coded for recognised behaviour interventions under professional supervision, the predominance of the biomedical view we noted would also have turned out far more pronounced. Not encountering behavioural interventions under our strict definition led to a further difficulty, namely

deciding at what point an action may (still) be considered a behavioural intervention, more generally. We concluded that the examples found in the books could suitably be categorically sorted as shown below, and decided to exclude only data coded in the last category, of the most general (and least clearly behavioural) sort:

- evidence-based interventions, such as parental training;
- training based on a point-scoring system, such as relaxation training;
- general actions, such as ‘doing odd jobs around the house’.

Moreover, any classification framework entails the grouping of idiosyncratic phenomena for which other groupings or alternative subdivisions might also be feasible. A detailed and sophisticated classification might therefore be an indicator of research quality, yet still fail to identify the most important meaning intended in a particular text or text passage. Furthermore, it is possible that books that we considered biased in terms of their biomedical or psychosocial orientation, are nuanced and sophisticated in other important aspects: the work of text interpretation is never done.

Discussion

Thirteen perspective-dependent elements were identified in the nine youth information books about ADHD that we analysed. Eight of these elements reflect a biomedical view of ADHD: ADHD as cause, biological factors, clinical diagnosis, brain abnormality, medication, neurofeedback, heritability and persistence. Five elements found in the books associate with a psychosocial view: ADHD as perceived behaviour, environmental factors, descriptive diagnosis, behavioural intervention and normalisation. The most frequent text passages encountered describe ADHD as a brain abnormality, and discuss medical treatment and behavioural advice. Hence, biomedical information predominates in youth information books on ADHD available in Dutch, relative to psychosocial information. This conclusion matches the established dominance of biomedical information on ADHD in for example newspapers (7), on websites (8), and on television (9).

Almost all books included in our analysis explicitly state that ADHD is caused by a brain abnormality. However, scientists do continue to debate this point. While some have argued that ADHD is a disorder of the brain (4, 10, 11, 30), others (5, 32, 33, 34) have pointed out that no research is published that conclusively determines a medical cause of ADHD (or any other DSM defined disorder) (35). Recently a new brain study of ADHD appeared, one of the largest of its kind to date, and the authors concluded

“We confirm, with high-powered analysis, that patients with ADHD have altered brains; therefore ADHD is a disorder of the brain” and “this message is free for clinicians to convey to parents and patients” (12). However, it seems that the authors of the article, as well as many of the writers of the books in our sample have overlooked a major issue: all these findings are mere group findings. This means that many with an ADHD classification do not have smaller brains while many without the ADHD classification do have smaller than average brains (15, 16). As Corrigan and Whitaker (36) phrased it: the chance at successfully predicting ADHD problems by checking a brain scan is not much larger than tossing a coin. Seen in this light, our analysis may well point to a development that has been coined neuroessentialism, whereby findings from neurobiological research that seem pertinent to social life today gain the status of cultural memes, albeit perhaps as an unintended consequence of such research (37). In light of such an ongoing scientific discussion, in our view the most prudent assessment of the state of play at present is that the matter of causality remains to be settled, and hence to clearly communicate this lack of clear scientific consensus also to children and youth in information books. Furthermore, there is not one combination of causal factors that applies to all those children that fall under the ADHD umbrella. Multiple pathway models to an extent do accommodate this vision (38) although this does not mean that scholars necessarily incorporate environmental/cultural understandings rather than combine multiple neuroessentialistic pathways (39).

In all of the books we studied, authors have written about medication as treatment of ADHD. Many passages in the books inform about the beneficial effects of medication, often stressing its advantages in helping children control their behaviour. The possible side effects on the other hand — such as decreased appetite, weight loss, and abdominal pain (40) in the short term and cardiovascular risks (41) and growth retardation (14) in the long term — are mostly marginally discussed in just two out of the nine books. These risks of side effects, or the unintended consequences of taking medication, have been known for years (42, 43) and it is distinctly odd that books claiming to inform children and youth hardly mention this.

Besides adverse effects, the effectiveness of psychotropic drugs is also subject to a long-standing debate. Although initial results of the largest ADHD treatment study to date (MTA) favoured medication over psychosocial treatments (44), follow-up results (45) indicated that the advantages of medication disappeared after a few years and that continued treatment with stimulants showed worse outcomes

over time than behaviour treatment. However, just as the ADHD guidelines were not adjusted in light of these new findings (46), our sample of books also fail to show the ineffectiveness of medication in the long run.

Sparks and Duncan (47) claim that prescribing children with medication can present as an ethical problem and so needs to be considered a last resort, precisely with respect to its longer term consequences. Children are by way of their young age likely to have trouble with making the forward projection that is needed for sound judgment on long-term effects of medication. Children also have the least power to say no to experts and professionals claiming to act in their best interest, and typically trust that their parents or carers can judge what is best for them. However, children do have a participation right, meaning that children's own views cannot merely be sidelined in underscoring what is in their best interest, neither by experts nor even by parents or carers. The need to take the views of children and young people themselves seriously and into account further highlights the importance of both balanced information sharing and such social dynamics as are entailed in psychosocial views of ADHD.

Behaviour therapy is listed in this study under behavioural interventions, but it receives little attention in the books we studied. Various reference is made to different types of behavioural intervention, but a specific and sound description of behaviour therapies and their merits (29, 48) is nowhere to be found. Compared to the extensive descriptions of medical treatment found in the books, descriptions of behaviour therapy as treatment are notably weak. Children and youth concerned would benefit in their understanding of ADHD if far more detailed information on behaviour therapies and scientific evidence regarding them was made available to them.

It seems appropriate to add a further comment on textual silence. Beyond information that could be given more consideration, some areas of empirical investigation relevant to understanding ADHD were entirely absent. For instance, it has been known for years that in many countries around the world, children who are relatively young in their classroom are diagnosed more often with ADHD and receive treatment with psychostimulants (48). However, many of these children are likely displaying age-appropriate behaviour. In light of the evidence on this point, it seems fair to suggest that youth literature on ADHD should include discussion of this phenomenon. Birth-month studies alert to a potential source of ADHD misdiagnoses, as well as our propensity to seek medical aid for adult's

assessment of children's conduct that, in this case, seems due to a confounding phenomenon.

Finally, more than half of the youth books we studied mention high heritability estimates for ADHD. These are derived from twin and adoption studies, which often report high numbers, some 60–91%, for heritability of behaviour traits (49). A recent study revealed that many academic textbooks cite only these high estimates found from twin studies, which focus almost exclusively on behaviours, in isolation from the social context to which they are a response. Moreover, the books omit that the high percentages observed in twin studies contrast sharply with the much lower estimates from genetically informed molecular studies (50). These studies conclude that when aggregated, genes explain 4% of behaviours named as ADHD at most (51). This divergence between twin studies and molecular studies, known as the 'missing heritability problem' (52) or 'phantom heritability' (53) reveals an important limitation of twin studies: their findings do not point to a direct influence of genes, but to a combination of genes and environment. This too points to important information that was missing in the nine youth information books analysed in this study. Definite pronouncements were found about the (high) heritability of ADHD, without any reference to the limitations that need to be noted for these estimates. However, by positing ADHD as mostly inherited, the risk that parents, teachers and treating professionals expect little from behaviour therapy and other appropriate responses will only increase (54).

Conclusions

Our textual analysis of nine information books on ADHD aimed at youth and written in Dutch reveals that biomedical information about ADHD predominates, relative to psychosocial information. A majority of the books therefore reflect an orientation towards ADHD as presenting a persistent disorder caused by an (inheritable) brain abnormality that is amenable to medical treatment. Psychosocial views of ADHD are under-represented in various aspects: only the element 'behavioural advice' is recurrent across the nine books studied. The influence of contextual factors such as the manner of raising children (21), social and demographic factors (22), socio-economic disadvantage (23), and more broadly societal factors (5, 24) are barely if at all mentioned. A discussion of more nuanced and often confounding evidence regarding ADHD — skewed diagnosis within age groups (48), or the missing heritability in twin studies (53, 54) — is entirely missing in the books we analysed.

The single-sided prioritising of biomedical elements hides the direct influence of the environments in which children live: what is on offer, relative to the available research, is an incomplete and somewhat impoverished understanding of the sorts of behaviours that we increasingly file under the ADHD construct. The observed bias towards biomedical conceptions of ADHD matters because psychosocial intervention and special education more generally are precisely focussed on children in the context in which they develop and grow up — including their family, their school and their neighbourhood, but also society, the time and the culture in which we live. Youth information books that contain a far more diverse reflection of research available on ADHD and what that research tells us are therefore needed.

Recommendations to authors of information books on ADHD

In light of the diversity in scholarship available on ADHD that we have highlighted throughout, a clear first recommendation is for youth to be more expressly informed about *both* biomedical and psychosocial conceptions of ADHD. Wherever the choice is made — as in most of the books we studied — to foreground medication as treatment of ADHD, authors ought at the very least to also recognise known uncertainties and risks relating to medication, including in relation to the longer term use of medication. Failing to do so amounts in effect to negligence in the duty to attend to the quality of information one is claiming to impart to young people.

Besides the pros and cons of medical treatment, behavioural therapy would ideally receive as much and equally balanced discussion, which in our view suggests that authors writing on ADHD need to show themselves more informed about behavioural therapy than appears to be the case in the books that were included in this study.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders: DSM-5™ (5th Ed.). Arlington, VA, US: American Psychiatric Publishing, Inc.; 2013.
2. Danielson ML, Bitsko RH, Ghandour RM, Holbrook JR, Kogan MD, Blumberg SJ. Prevalence of parent-reported ADHD diagnosis and associated treatment among U.S. children and adolescents, 2016. *J Clin Child Adolesc Psychol* 2018;47(2):199-212.
3. SFK. Toename in Gebruik Van Methylfenidaat Lijkt Voorbij. Stichting Farmaceutische Kengetallen; 2017. Available from: <https://www.sfk.nl>
4. Faraone SV, Asherson P, Banaschewski T, Biederman J, Buitelaar JK, Ramos-Quiroga JA, et al. Attention-deficit/hyperactivity disorder. *Nat Rev Dis Primers* 2015;6(1): 15020.
5. Timimi S. Non-diagnostic based approaches to helping children who could be labelled ADHD and their families. *Int J Qual Stud Health Well-being* 2017;12(sup1):1298270.
6. Thoutenhoofd ED. New techniques of difference: On data as school pupils. *Stud Philos Educ* 2017;36(5):517-32.
7. Gonon F, Konsman J, Cohen D, Boraud T, Boutron I. Why most biomedical findings echoed by newspapers turn out to be false: The case of attention deficit hyperactivity disorder. *PLoS One* 2012;7(9):1-11.
8. Mitchell J, Read J. Attention-deficit hyperactivity disorder, drug companies and the internet. *Clin Child Psychol Psychiatry* 2012;17(1):121-39.
9. Ponnou S, Gonon F. How French media have portrayed ADHD to the lay public and to social workers. *Int J Qual Stud Health Well-being* 2017;12(sup1):1298244
10. Barkley RA. Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment. New York: Guilford Publications; 2006.
11. Biederman J, Faraone SV. Attention-deficit hyperactivity disorder. *Lancet* 2005;366(9481):237-48.
12. Hoogman M, Bralten J, Hibar DP, Mennes M, Zwiers MP, Scherren LSJ, et al. Subcortical brain volume differences in participants with attention deficit hyperactivity disorder in children and adults: a cross-sectional mega-analysis. *Lancet Psychiatry* 2017;4(4):310-9.
13. Storebø OJ, Krogh HB, Ramstad E, Moreira-Maia CR, Holmskov M, Skoog M, et al. Methylphenidate for attention-deficit/hyperactivity disorder in children and adolescents: Cochrane systematic review with meta-analyses and trial sequential analyses of randomised clinical trials. *BMJ* 2015;351:h5203.
14. Swanson JM, Arnold LE, Molina BS, Sibley MH, Hechtman LT, Hinshaw SP, et al. Young adult outcomes in the follow-up of the multimodal treatment study of attention-deficit/hyperactivity disorder: symptom persistence, source discrepancy, and height suppression. *J Child Psychol Psychiatry* 2017;58(6):663-78.
15. Batstra L, Nieweg EH, Hadders-Algra M. Exploring five common assumptions on attention deficit hyperactivity disorder. *Acta Paediatr* 2014;103(7):696-700.
16. Dehue T, Bijl D, de Winter M, Scheepers F, Vanheule S, van Os J, et al. Subcortical brain volume differences in participants with attention deficit hyperactivity disorder in children and adults. *Lancet Psychiatry* 2017;4(6):438-9.
17. Lakoff A. Adaptive will: The evolution of attention deficit disorder. *J Hist Behav Sci* 2000;36(2):149-69.
18. Lloyd G, Stead J, Cohen D. Critical New Perspectives on ADHD. New York: Routledge; 2006.
19. Brülde B. On defining “mental disorder”: Purposes and conditions of adequacy. *Theor Med Bioeth* 2010;31(1):19-33.
20. Hacking I. The social construction of what? Cambridge, MA: Harvard University Press; 1999.
21. Bronfenbrenner U. The ecology of human development. Cambridge, MA: Harvard University Press; 2009.
22. Stolz J. ADHD in America: A bioecological analysis. *Ethical Hum Psychol Psychiatry* 2005;7(1):65-75.
23. Ingold T. Becoming persons: consciousness and sociality in human evolution. *Cultural Dynamics* 1991;4(3):355-78.

24. Johnston C, Mash EJ. Families of children with attention-deficit/hyperactivity disorder: review and recommendations for future research. *Clin Child Fam Psychol Rev* 2001;4(3):183-207.
25. Hjern A, Weitoft GR, Lindblad F. Social adversity predicts ADHD-medication in school children--a national cohort study. *Acta Paediatr* 2010;99(6):920-4.
26. Russell AE, Ford T, Williams R, Russell G. The association between socioeconomic disadvantage and attention deficit/hyperactivity disorder (ADHD): a systematic review. *Child Psychiatry Hum Dev* 2016;47(3):440-58.
27. Health Council of the Netherlands. ADHD: Medication and society. The Hague: Health Council of the Netherlands 2014. Available from <https://www.healthcouncil.nl>
28. Faraone SV, Perlis RH, Doyle AE, Smoller JW, Goralnick JJ, Holmgren MA, et al. Molecular genetics of attention-deficit/hyperactivity disorder. *Biol Psychiatry* 2005;57(11):1313-23.
29. Fabiano GA, Pelham Jr WE, Coles EK, Gnagy EM, Chronis-Tuscano A, O'Connor BC. A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder. *Clin Psychol Rev* 2009;29(2):129-40.
30. Schreier M. Qualitative content analysis in practice. Sage Publications; 2012.
31. Taylor E, Döpfner M, Sergeant J, Asherson P, Banaschewski T, Buitelaar J, et al. European clinical guidelines for hyperkinetic disorder--first upgrade. *Eur Child Adolesc Psychiatry* 2004;13(1): i7-130.
32. Barkley RA. Recent longitudinal studies of childhood attention-deficit/hyperactivity disorder: Important themes and questions for further research. *J Abnorm Psychol* 2016;125(2):248-55.
33. Gonon F. The dopaminergic hypothesis of attention-deficit/hyperactivity disorder needs re-examining. *Trends in Neurosci* 2009;32(1):2-8.
34. Timimi S, Taylor E. ADHD is best understood as a cultural construct. *Bri J Psychiatry* 2004;184(1):8-9.
35. Kupfer DJ, First MB, Regier DA. A research agenda for DSM V. Washington DC: American Psychiatric Publishing; 2008.
36. Corrigan MW and Whitaker. Lancet Psychiatry Needs to Retract the ADHD-Enigma Study. *Mad in America* 2017. Available from: <https://www.madinamerica.com/2017/04/lancet-psychiatry-needs-to-retract-the-adhd-enigma-study/>
37. Holmskov M, Storebø OJ, Moreira-Maia CR, Ramstad E, Magnusson FL, Krogh HB, et al. Gastrointestinal adverse events during methylphenidate treatment of children and adolescents with attention deficit hyperactivity disorder: A systematic review with meta-analysis and Trial Sequential Analysis of randomised clinical trials. *PloS One* 2017;12(6):e0178187.
38. Sonuga-Barke EJ, Auerbach J, Campbell SB, Daley D, Thompson M. Varieties of preschool hyperactivity: multiple pathways from risk to disorder. *Dev Sci* 2005;8(2):141-50.
39. Pauli-Pott U, Schloss S, Heinzel-Gutenbrunner M, Becker K. Multiple causal pathways in attention-deficit/hyperactivity disorder - Do emerging executive and motivational deviations precede symptom development? *Child Neuropsychol* 2019;25(2):179-97.
40. Reiner PB. The rise of neuroessentialism. In: Illes J, Sahakian J (eds.) *Oxford Handbook of Neuroethics*. New York: Oxford University Press; 2011.
41. Hennissen L, Bakker MJ, Banaschewski T, Carucci S, Coghill D, Danckaerts M, et al. Cardiovascular effects of stimulant and non-stimulant medication for children and adolescents with ADHD: a systematic review and meta-analysis of trials of methylphenidate, amphetamines and atomoxetine. *CNS Drugs* 2017;31(3):199-215.
42. Furman LM. Attention-deficit hyperactivity disorder (ADHD): Does new research support old concepts? *J Child Neurol* 2008;23(7):775-784.
43. Wolraich ML, McGuinn L, Doffing M. Treatment of attention deficit hyperactivity disorder in children and adolescents. *Drug Saf* 2007;30(1):17-26.
44. MTA cooperative group. A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. The MTA Cooperative Group. Multimodal treatment study of children with ADHD. *Arch Gen Psychiatry* 1999;56(12):1073-86.
45. Jensen PS, Arnold LE, Swanson JM, Vitiello B, Abikoff HB, Greenhill LL, et al. 3-Year Follow-up of the NIMH MTA Study. *J Am Acad Child Adolesc Psychiatry* 2007;46(8):989-1002.
46. Nieuweg EH. [Does ADHD medication stop working after 2-3 years? On the surprising, but little-known follow-up of the MTA study]. *Tijdschrift Voor Psychiatrie* 2010;52(4):245-54.
47. Sparks JA, Duncan BL. The ethics and science of medicating children. *Ethical Hum Sci Serv* 2004;6(1):25-39.
48. Whitely M, Raven M, Timimi S, Jureidini J, Phillimore J, Leo J, et al. Attention deficit hyperactivity disorder late birthdate effect common in both high and low prescribing international jurisdictions: a systematic review. *J Child Psychol Psychiatry* 2019;60(4):380-91.
49. Thapar A, Langley K, Owen MJ, O'donovan MC. Advances in genetic findings on attention deficit hyperactivity disorder. *Psychol Med* 2007;37(12):1681-92.
50. te Meerman S, Batstra L, Hoekstra R, Grietens H. Academic textbooks on ADHD genetics: balanced or biased? *Int J Qual Stud Health Well-Being* 2017;12(sup1):1305590.
51. Franke B, Neale B, Faraone S. Genome-wide association studies in ADHD. *Hum Genet* 2009;126(1):13-50.
52. Maher B. The case of the missing heritability. *Nature* 2008;456(7218):18.
53. Zuk O, Hechter E, Sunyaev SR, Lander ES. The mystery of missing heritability: Genetic interactions create phantom heritability. *Proc Natl Acad Sci U S A* 2012;109(4):1193-8.
54. te Meerman S, Batstra L, Grietens H, Frances A. ADHD: a critical update for educational professionals. *Int J Qual Stud Health Well-Being* 2017b;12(sup1):1298267.